



## SEQUENCE LISTING

<110> MURPHY, JOHN R.  
O'LEAR, EDWARD  
HARRISON, ROBERT J.

<120> VACCINE COMPOSITIONS

<130> AMSC 3.3-001 CONT

<140> 10/822,953

<141> 2004-04-12

<150> 09/868,753

<151> 2001-06-21

<150> PCT/US00/29231

<151> 2000-10-23

<150> 60/161,292

<151> 1999-10-25

<150> 60/161,193

<151> 1999-10-22

<160> 36

<170> PatentIn Ver. 3.2

<210> 1

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 1

accagatctg ccgaaaaact tcga

24

<210> 2

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 2

accagatctc cgccttttagt attta

25

<210> 3

<211> 27

<212> DNA

<213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: Native tox  
 operator

<400> 3  
 ataattagga tagctttacc taattat

27

<210> 4  
 <211> 19  
 <212> DNA  
 <213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: Illustrative  
 polynucleotide target site

<400> 4  
 gtaggttagg ctaacctat

19

<210> 5  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Consensus-binding  
 sequence

<220>  
 <221> modified\_base  
 <222> (2)  
 <223> a, t, c, g, unknown or other

<220>  
 <221> modified\_base  
 <222> (4)  
 <223> a, t, c, g, unknown or other

<220>  
 <221> modified\_base  
 <222> (10)  
 <223> a, t, c, g, unknown or other

<220>  
 <221> modified\_base  
 <222> (14)  
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<220>  
 <221> modified\_base  
 <222> (18)..(19)  
 <223> a, t, c, g, unknown or other

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 <222> (22)..(25)  
 <223> a, t, c, g, unknown or other

<400> 5  
 ananttaggn tagnctannc tnnnn

25

<210> 6  
 <211> 19  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Illustrative  
 variant polynucleotide sequence

<400> 6  
 twagggttags ctaacctwa

19

<210> 7  
 <211> 230  
 <212> PRT  
 <213> Mycobacterium tuberculosis

<400> 7  
 Met Asn Glu Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
     1                    5                    10                    15  
 Asp Leu Glu Glu Glu Gly Val Thr Pro Leu Arg Ala Arg Ile Ala Glu  
                     20                    25                    30  
 Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ser Arg Met  
             35                    40                    45  
 Glu Arg Asp Gly Leu Leu Arg Val Ala Gly Asp Arg His Leu Glu Leu  
             50                    55                    60  
 Thr Glu Lys Gly Arg Ala Leu Ala Ile Ala Val Met Arg Lys His Arg  
     65                    70                    75                    80  
 Leu Ala Glu Arg Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Glu  
                     85                    90                    95  
 Val His Ala Glu Ala Cys Arg Trp Glu His Val Asn Ser Glu Asp Val  
             100                    105                    110  
 Glu Arg Arg Leu Val Lys Val Leu Asn Asn Pro Thr Thr Ser Pro Phe  
             115                    120                    125  
 Gly Asn Pro Ile Pro Gly Leu Val Glu Leu Gly Val Gly Pro Glu Pro  
             130                    135                    140  
 Gly Ala Asp Asp Ala Asn Leu Val Arg Leu Thr Glu Leu Pro Ala Gly  
     145                    150                    155                    160

Ser	Pro	Val	Ala	Val	Val	Val	Arg	Gln	Leu	Thr	Glu	His	Val	Gln	Gly
								165		170		175			
Asp	Ile	Asp	Leu	Ile	Thr	Arg	Leu	Lys	Asp	Ala	Gly	Val	Val	Pro	Asn
								180		185		190			
Ala	Arg	Val	Thr	Val	Glu	Thr	Thr	Pro	Gly	Gly	Gly	Val	Thr	Ile	Val
								195		200		205			
Ile	Pro	Gly	His	Glu	Asn	Val	Thr	Leu	Pro	His	Glu	Met	Ala	His	Ala
								210		215		220			
Val	Lys	Val	Glu	Lys	Val										
225						230									

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<210> 8
<211> 223
<212> PRT
<213> Corynebacterium diphtheriae
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<400> 8																
Met	Lys	Asp	Leu	Val	Asp	Thr	Thr	Glu	Met	Tyr	Leu	Arg	Thr	Ile	Tyr	
1				5					10					15		
Glu	Leu	Glu	Glu	Glu	Gly	Val	Thr	Pro	Leu	Arg	Ala	Arg	Ile	Ala	Glu	
			20					25					30			
Arg	Leu	Glu	Gln	Ser	Gly	Pro	Thr	Val	Ser	Gln	Thr	Val	Ala	Arg	Met	
		35					40					45				
Glu	Arg	Asp	Gly	Leu	Val	Val	Val	Ala	Ser	Asp	Ser	Leu	Gln	Met	Thr	
	50					55					60					
Pro	Thr	Gly	Arg	Thr	Leu	Ala	Thr	Ala	Val	Met	Arg	Lys	His	Arg	Leu	
65					70					75					80	
Ala	Glu	Arg	Leu	Leu	Thr	Asp	Ile	Ile	Gly	Leu	Asp	Ile	Asn	Lys	Val	
				85					90					95		
His	Asp	Glu	Ala	Cys	Arg	Trp	Glu	His	Val	Met	Ser	Asp	Glu	Val	Glu	
			100					105					110			
Arg	Arg	Leu	Val	Lys	Val	Lys	Asp	Val	Ser	Arg	Ser	Pro	Phe	Gly	Asn	
		115					120					125				
Pro	Ile	Pro	Gly	Leu	Asp	Glu	Leu	Gly	Val	Gly	Asn	Ser	Asp	Ala	Ala	
	130					135					140					
Ala	Pro	Gly	Thr	Arg	Val	Ile	Asp	Ala	Ala	Thr	Ser	Met	Pro	Arg	Lys	
145					150					155					160	
Val	Arg	Ile	Val	Gln	Ile	Asn	Glu	Ile	Phe	Gln	Val	Glu	Thr	Asp	Gln	
				165					170					175		

Phe Gln Leu Leu Asp Ala Asp Ile Arg Val Gly Ser Glu Val Glu Ile  
 180 185 190

Val Asp Arg Asp Gly His Ile Thr Leu Ser His Asn Gly Lys Asp Val  
 195 200 205

Glu Leu Leu Asp Asp Leu Ala His Thr Ile Arg Ile Glu Glu Leu  
 210 215 220

<210> 9

<211> 174

<212> PRT

<213> Staphylococcus epidermitis

<400> 9

Met Thr Val Ser Cys Pro Pro Pro Ser Thr Ser Glu Arg Glu Glu Gln  
 1 5 10 15

Ala Arg Ala Leu Cys Leu Arg Leu Leu Thr Ala Arg Ser Arg Thr Arg  
 20 25 30

Ala Glu Leu Ala Gly Gln Leu Ala Lys Arg Gly Tyr Pro Glu Asp Ile  
 35 40 45

Gly Asn Arg Val Leu Asp Arg Leu Ala Ala Val Gly Leu Val Asp Asp  
 50 55 60

Thr Asp Phe Ala Glu Gln Trp Val Gln Ser Arg Arg Ala Asn Ala Ala  
 65 70 75 80

Lys Ser Lys Arg Ala Leu Ala Ala Glu Leu His Ala Lys Gly Val Asp  
 85 90 95

Asp Asp Val Ile Thr Thr Val Leu Gly Gly Ile Asp Ala Gly Ala Glu  
 100 105 110

Arg Gly Arg Ala Glu Lys Leu Val Arg Ala Arg Leu Arg Arg Glu Val  
 115 120 125

Leu Ile Asp Asp Gly Thr Asp Glu Ala Arg Val Ser Arg Arg Leu Val  
 130 135 140

Ala Met Leu Ala Arg Arg Gly Tyr Gly Gln Thr Leu Ala Cys Glu Val  
 145 150 155 160

Val Ile Ala Glu Leu Ala Ala Glu Arg Glu Arg Arg Arg Val  
 165 170

<210> 10

<211> 225

<212> PRT

<213> Mycobacterium leprae

&lt;400&gt; 10

Met Asn Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
 1 5 10 15  
 Asp Leu Glu Glu Glu Gly Ile Val Thr Pro Leu Arg Ala Arg Ile Ala  
 20 25 30  
 Glu Arg Pro Thr Val Ser Gln Thr Val Ser Arg Met Glu Arg Asp Gly  
 35 40 45  
 Leu Leu Arg Val Ala Gly Asn Arg His Leu Glu Leu Thr Thr Lys Gly  
 50 55 60  
 Arg Ala Met Ala Ile Ala Val Met Arg Lys His Arg Leu Ala Glu Arg  
 65 70 75 80  
 Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Glu Val His Ala Glu  
 85 90 95  
 Ala Cys Arg Trp Glu His Val Met Ser Glu Asp Val Glu Arg Arg Leu  
 100 105 110  
 Ile Lys Val Leu Asn Asn Pro Thr Thr Ser Pro Phe Gly Asn Pro Ile  
 115 120 125  
 Pro Gly Leu Leu Asp Leu Gly Ala Gly Pro Asp Ala Ser Ala Ala Asn  
 130 135 140  
 Ala Lys Leu Val Arg Leu Thr Glu Leu Pro Ser Gly Ser Pro Val Ala  
 145 150 155 160  
 Val Val Val Arg Gln Leu Thr Glu His Val Asp Asp Ile Asp Leu Ile  
 165 170 175  
 Thr Arg Leu Lys Asp Thr Gly Val Val Pro Asn Ala Arg Val Thr Val  
 180 185 190  
 Glu Thr Ser Pro Ala Gly Asn Val Ile Ile Ile Ile Pro Gly His Glu  
 195 200 205  
 Asn Val Thr Leu Pro His Glu Met Ala His Ala Val Lys Val Glu Lys  
 210 215 220  
 Val  
 225

&lt;210&gt; 11

&lt;211&gt; 230

&lt;212&gt; PRT

&lt;213&gt; Mycobacterium tuberculosis

&lt;400&gt; 11

Met Asn Glu Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
 1 5 10 15

Asp Leu Glu Glu Glu Gly Val Thr Pro Leu Arg Ala Arg Ile Ala Glu  
                   20                  25                  30  
 Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ser Arg Met  
                   35                  40                  45  
 Glu Arg Asp Gly Leu Leu Arg Val Ala Gly Asp Arg His Leu Glu Leu  
                   50                  55                  60  
 Thr Glu Lys Gly Arg Ala Leu Ala Ile Ala Val Met Arg Lys His Arg  
                   65                  70                  75                  80  
 Leu Ala Glu Arg Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Glu  
                   85                  90                  95  
 Val His Ala Glu Ala Cys Arg Trp Glu His Val Met Ser Glu Asp Val  
                   100                  105                  110  
 Glu Arg Arg Leu Val Lys Val Leu Asn Asn Pro Thr Thr Ser Pro Phe  
                   115                  120                  125  
 Gly Asn Pro Ile Pro Gly Leu Val Glu Leu Gly Val Gly Pro Glu Pro  
                   130                  135                  140  
 Gly Ala Asp Asp Ala Asn Leu Val Arg Leu Thr Glu Leu Pro Ala Gly  
                   145                  150                  155                  160  
 Ser Pro Val Ala Val Val Val Arg Gln Leu Thr Glu His Val Gln Gly  
                   165                  170                  175  
 Asp Ile Asp Leu Ile Thr Arg Leu Lys Asp Ala Gly Val Val Pro Asn  
                   180                  185                  190  
 Ala Arg Val Thr Val Glu Thr Thr Pro Gly Gly Gly Val Thr Ile Val  
                   195                  200                  205  
 Ile Pro Gly His Glu Asn Val Thr Leu Pro His Glu Met Ala His Ala  
                   210                  215                  220  
 Val Lys Val Glu Lys Val  
                   225                  230

<210> 12

<211> 233

<212> PRT

<213> Mycobacterium smegmatis

<400> 12

Met Asn Asp Leu Val Asp Thr Thr Glu Asn Tyr Leu Arg Thr Ile Tyr  
                   1                  5                  10                  15

Asp Leu Glu Glu Glu Gly Val Val Pro Leu Arg Ala Arg Ile Ala Glu  
                   20                  25                  30

Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ser Arg Met  
                   35                  40                  45

Glu Arg Asp Gly Leu Leu His Val Ala Gly Asp Arg His Leu Glu Leu  
 50 55 60  
 Thr Asp Lys Gly Arg Ala Leu Ala Val Ala Val Met Arg Lys His Arg  
 65 70 75 80  
 Leu Ala Glu Arg Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Asp  
 85 90 95  
 Val His Ala Glu Ala Cys Arg Trp Glu His Val Met Ser Glu Glu Val  
 100 105 110  
 Glu Arg Arg Leu Val Gln Val Leu Glu Asn Pro Thr Thr Ser Pro Phe  
 115 120 125  
 Gly Asn Pro Ile Pro Gly Leu Thr Glu Leu Ala Val Thr Pro Gly Val  
 130 135 140  
 Asn Thr Glu Asp Val Ser Leu Val Arg Leu Thr Glu Leu Pro Val Gly  
 145 150 155 160  
 Met Pro Val Ala Val Val Val Arg Gln Leu Thr Glu His Val Gln Gly  
 165 170 175  
 Asp Thr Asp Leu Ile Gly Arg Leu Lys Glu Ala Gly Val Val Pro Asn  
 180 185 190  
 Ala Arg Val Thr Val Glu Ala Asn Asn Asn Gly Gly Val Met Ile Val  
 195 200 205  
 Ile Pro Gly His Glu Gln Val Glu Leu Pro His His Met Ala His Ala  
 210 215 220  
 Val Lys Val Glu Lys Val Glu Lys Val  
 225 230

<210> 13  
 <211> 174  
 <212> PRT  
 <213> Mycobacterium tuberculosis

<400> 13  
 Met Thr Val Ser Cys Pro Pro Pro Ser Thr Ser Glu Arg Glu Glu Gln  
 1 5 10 15  
 Ala Arg Ala Leu Cys Leu Arg Leu Leu Thr Ala Arg Ser Arg Thr Arg  
 20 25 30  
 Ala Glu Leu Ala Gly Gln Leu Ala Lys Arg Gly Tyr Pro Glu Asp Ile  
 35 40 45  
 Gly Asn Arg Val Leu Asp Arg Leu Ala Ala Val Gly Leu Val Asp Asp  
 50 55 60



Thr Asp Phe Ala Glu Gln Trp Val Gln Ser Arg Arg Ala Asn Ala Ala  
 65 70 75 80  
 Lys Ser Lys Arg Ala Leu Ala Ala Glu Leu His Ala Lys Gly Val Asp  
 85 90 95  
 Asp Asp Val Ile Thr Thr Val Leu Gly Gly Ile Asp Ala Gly Ala Glu  
 100 105 110  
 Arg Gly Arg Ala Glu Lys Leu Val Arg Ala Arg Leu Arg Arg Glu Val  
 115 120 125  
 Leu Ile Asp Asp Gly Thr Asp Glu Ala Arg Val Ser Arg Arg Leu Val  
 130 135 140  
 Ala Met Leu Ala Arg Arg Gly Tyr Gly Gln Thr Leu Ala Cys Glu Val  
 145 150 155 160  
 Val Ile Ala Glu Leu Ala Ala Glu Arg Glu Arg Arg Arg Val  
 165 170

<210> 14

<211> 228

<212> PRT

<213> Brevibacterium lactofermentum

<400> 14

Met Lys Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
 1 5 10 15  
 Glu Leu Glu Glu Glu Gly Ile Val Pro Leu Arg Ala Arg Ile Ala Glu  
 20 25 30  
 Arg Leu Glu Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ala Arg Met  
 35 40 45  
 Glu Arg Asp Gly Leu Val His Val Ser Pro Asp Arg Ser Leu Glu Met  
 50 55 60  
 Thr Pro Glu Gly Arg Ser Leu Ala Ile Ala Val Met Arg Asn Asp Arg  
 65 70 75 80  
 Leu Ala Glu Arg Leu Leu Thr Asp Ile Ile Gly Leu Asp Ile His Lys  
 85 90 95  
 Val His Asp Glu Ala Cys Arg Trp Glu His Val Met Ser Asp Glu Val  
 100 105 110  
 Glu Arg Arg Leu Val Glu Val Leu Asp Asp Val His Arg Ser Pro Phe  
 115 120 125  
 Gly Asn Pro Ile Pro Gly Leu Gly Glu Ile Gly Leu Asp Gln Ala Asp  
 130 135 140  
 Glu Pro Asp Ser Gly Val Arg Ala Ile Asp Leu Pro Leu Gly Glu Asn  
 145 150 155 160

Leu Lys Ala Arg Ile Val Gln Leu Asn Glu Ile Leu Gln Val Asp Leu  
 165 170 175  
 Glu Gln Phe Gln Ala Leu Thr Asp Ala Gly Val Glu Ile Gly Thr Glu  
 180 185 190  
 Val Asp Ile Ile Asn Glu Gln Gly Arg Val Val Ile Thr His Asn Gly  
 195 200 205  
 Ser Ser Val Glu Leu Ile Asp Asp Leu Ala His Ala Val Arg Val Glu  
 210 215 220  
 Lys Val Glu Gly  
 225

<210> 15  
 <211> 226  
 <212> PRT  
 <213> *Corynebacterium diphtheriae*

<400> 15  
 Met Lys Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
 1 5 10 15  
 Glu Leu Glu Glu Glu Gly Val Thr Pro Leu Arg Ala Arg Ile Ala Glu  
 20 25 30  
 Arg Leu Glu Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ala Arg Met  
 35 40 45  
 Glu Arg Asp Gly Leu Val Val Val Ala Ser Asp Arg Ser Leu Gln Met  
 50 55 60  
 Thr Pro Thr Gly Arg Thr Leu Ala Thr Ala Val Met Arg Lys His Arg  
 65 70 75 80  
 Leu Ala Glu Arg Leu Leu Thr Asp Ile Ile Gly Leu Asp Ile Asn Lys  
 85 90 95  
 Val His Asp Glu Ala Cys Arg Trp Glu His Val Met Ser Asp Glu Val  
 100 105 110  
 Glu Arg Arg Leu Val Lys Val Leu Lys Asp Val Ser Arg Ser Pro Phe  
 115 120 125  
 Gly Asn Pro Ile Pro Gly Leu Asp Glu Leu Gly Val Gly Asn Ser Asp  
 130 135 140  
 Ala Ala Ala Pro Gly Thr Arg Val Ile Asp Ala Ala Thr Ser Met Pro  
 145 150 155 160  
 Arg Lys Val Arg Ile Val Gln Ile Asn Glu Ile Phe Gln Val Glu Thr  
 165 170 175

Asp Gln Phe Thr Gln Leu Leu Asp Ala Asp Ile Arg Val Gly Ser Glu  
180 185 190

Val Glu Ile Val Asp Arg Asp Gly His Ile Thr Leu Ser His Asn Gly  
195 200 205

Lys Asp Val Glu Leu Leu Asp Asp Leu Ala His Thr Ile Arg Ile Glu  
210 215 220

Glu Leu  
225

<210> 16

<211> 230

<212> PRT

<213> Mycobacterium tuberculosis

<400> 16

Met Asn Glu Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
1 5 10 15

Asp Leu Glu Glu Glu Gly Val Thr Pro Leu Arg Ala Arg Ile Ala Glu  
20 25 30

Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ser Arg Met  
35 40 45

Glu Arg Asp Gly Leu Leu Arg Val Ala Gly Asp Arg His Leu Glu Leu  
50 55 60

Thr Glu Lys Gly Arg Ala Leu Ala Ile Ala Val Met Arg Lys His Arg  
65 70 75 80

Leu Ala Glu Arg Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Glu  
85 90 95

Val His Ala Glu Ala Cys Arg Trp Glu His Val Met Ser Glu Asp Val  
100 105 110

Glu Arg Arg Leu Val Lys Val Leu Asn Asn Pro Thr Thr Ser Pro Phe  
115 120 125

Gly Asn Pro Ile Pro Gly Leu Val Glu Leu Gly Val Gly Pro Glu Pro  
130 135 140

Gly Ala Asp Asp Ala Asn Leu Val Arg Leu Thr Glu Leu Pro Ala Gly  
145 150 155 160

Ser Pro Val Ala Val Val Val Arg Gln Leu Thr Glu His Val Gln Gly  
165 170 175

Asp Ile Asp Leu Ile Thr Arg Leu Lys Asp Ala Gly Val Val Pro Asn  
180 185 190

Ala Arg Val Thr Val Glu Thr Thr Pro Gly Gly Gly Val Thr Ile Val  
195 200 205

Ile Pro Gly His Glu Asn Val Thr Leu Pro His Glu Met Ala His Ala  
 210 215 220

Val Lys Val Glu Lys Val  
 225 230

<210> 17

<211> 235

<212> PRT

<213> Mycobacterium smegmatis

<400> 17

Met Asn Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
 1 5 10 15

Asp Leu Glu Glu Glu Gly Val Val Pro Leu Arg Ala Arg Ile Ala Glu  
 20 25 30

Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ser Arg Met  
 35 40 45

Glu Arg Asp Gly Leu Leu His Val Ala Gly Asp Arg His Leu Glu Leu  
 50 55 60

Thr Asp Lys Gly Arg Ala Leu Ala Val Ala Val Met Arg Lys His Arg  
 65 70 75 80

Leu Ala Glu Arg Leu Leu Val Asp Val Ile Leu Pro Trp Glu Asp Gly  
 85 90 95

Val His Ala Glu Ala Cys Arg Trp Glu His Val Met Ser Glu Glu Val  
 100 105 110

Glu Arg Arg Leu Val Gln Val Leu Glu Asn Pro Thr Thr Ser Pro Phe  
 115 120 125

Gly Asn Pro Ile Pro Gly Leu Thr Glu Leu Ala Val Thr Pro Gly Val  
 130 135 140

Asn Thr Glu Asp Val Ser Leu Val Arg Leu Thr Glu Leu Pro Val Gly  
 145 150 155 160

Met Pro Val Ala Val Val Val Arg Gln Leu Thr Glu His Val Gln Gly  
 165 170 175

Asp Thr Asp Leu Ile Gly Arg Leu Lys Glu Ala Gly Val Val Pro Asn  
 180 185 190

Ala Arg Val Thr Val Glu Ala Asn Asn Asn Gly Gly Val Met Ile Val  
 195 200 205

Ile Pro Gly His Glu Gln Val Glu Leu Pro His His Met Ala His Ala  
 210 215 220

Val Lys Lys Lys Val Glu Lys Val Glu Lys Val  
 225 230 235

<210> 18  
 <211> 225  
 <212> PRT  
 <213> Mycobacterium leprae

<400> 18  
 Met Asn Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
 1 5 10 15  
 Asp Leu Glu Glu Glu Gly Ile Val Thr Pro Leu Arg Ala Arg Ile Ala  
 20 25 30  
 Glu Arg Pro Thr Val Ser Gln Thr Val Ser Arg Met Glu Arg Asp Gly  
 35 40 45  
 Leu Leu Arg Val Ala Gly Asn Arg His Leu Glu Leu Thr Thr Lys Gly  
 50 55 60  
 Arg Ala Met Ala Ile Ala Val Met Arg Lys His Arg Leu Ala Glu Arg  
 65 70 75 80  
 Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Glu Val His Ala Glu  
 85 90 95  
 Ala Cys Arg Trp Glu His Val Met Ser Glu Asp Val Glu Arg Arg Leu  
 100 105 110  
 Ile Lys Val Leu Asn Asn Pro Thr Thr Ser Pro Phe Gly Asn Pro Ile  
 115 120 125  
 Pro Gly Leu Leu Asp Leu Gly Ala Gly Pro Asp Ala Ser Ala Ala Asn  
 130 135 140  
 Ala Lys Leu Val Arg Leu Thr Glu Leu Pro Ser Gly Ser Pro Val Ala  
 145 150 155 160  
 Val Val Val Arg Gln Leu Thr Glu His Val Asp Asp Ile Asp Leu Ile  
 165 170 175  
 Thr Arg Leu Lys Asp Thr Gly Val Val Pro Asn Ala Arg Val Thr Val  
 180 185 190  
 Glu Thr Ser Pro Ala Gly Asn Val Ile Ile Ile Ile Pro Gly His Glu  
 195 200 205  
 Asn Val Thr Leu Pro His Glu Met Ala His Ala Val Lys Val Glu Lys  
 210 215 220  
 Val  
 225

<210> 19

&lt;211&gt; 230

&lt;212&gt; PRT

&lt;213&gt; Streptomyces lividans

&lt;400&gt; 19

Met Ser Gly Leu Ile Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Leu  
 1 5 10 15

Glu Leu Glu Glu Glu Gly Val Val Pro Met Arg Ala Arg Ile Ala Glu  
 20 25 30

Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ala Arg Met  
 35 40 45

Glu Arg Asp Gly Leu Val Ser Val Ala Ala Asp Arg His Leu Glu Leu  
 50 55 60

Thr Asp Glu Gly Arg Arg Leu Ala Thr Arg Val Met Arg Lys His Arg  
 65 70 75 80

Leu Ala Glu Cys Leu Leu Val Asp Val Ile Gly Leu Glu Trp Glu Gln  
 85 90 95

Val His Ala Glu Ala Cys Arg Trp Glu His Val Met Ser Glu Ala Val  
 100 105 110

Glu Arg Arg Val Leu Glu Leu Leu Arg His Pro Thr Glu Ser Pro Tyr  
 115 120 125

Gly Asn Pro Ile Pro Gly Leu Glu Glu Leu Gly Glu Thr Asp Gly Ala  
 130 135 140

Asp Pro Phe Leu Asp Glu Gly Met Val Ser Leu Ala Asp Leu Asp Pro  
 145 150 155 160

Gly Gln Glu Gly Lys Thr Val Val Val Arg Arg Ile Gly Glu Pro Ile  
 165 170 175

Gln Thr Asp Ala Gln Leu Met Tyr Thr Leu Arg Arg Ala Gly Val Gln  
 180 185 190

Pro Gly Ser Val Val Ser Val Thr Glu Ser Ala Gly Gly Val Leu Val  
 195 200 205

Gly Ser Gly Gly Glu Ala Ala Glu Leu Glu Ala Asp Thr Ala Ser His  
 210 215 220

Val Phe Val Ala Lys Arg  
 225 230

&lt;210&gt; 20

&lt;211&gt; 215

&lt;212&gt; PRT

&lt;213&gt; Staphylococcus epidermidis

&lt;400&gt; 20

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Met Leu Thr Glu Glu Lys Glu Asp Tyr Leu Lys Ala Ile Leu Thr Asn
 1              5              10              15

Asp Gly Asp Val Ser Phe Val Ser Asn Lys Lys Leu Ser Gln Phe Leu
      20              25              30

Asn Ile Lys Pro Pro Ser Val Ser Glu Met Val Gly Arg Leu Glu Lys
      35              40              45

Glu Gly Tyr Val Glu Thr Lys His Tyr Lys Gly Ala Arg Leu Thr Glu
      50              55              60

Glu Gly Leu Lys Gln Thr Leu Asp Ile Ile Lys Arg His Arg Leu Leu
      65              70              75              80

Arg Leu Phe Leu Ile Glu Ile Leu Gln Tyr Asn Trp Glu Glu Val His
      85              90              95

Gln Glu Ala Glu Ile Leu Glu His Arg Ile Ser Asp Leu Phe Val Glu
      100              105              110

Arg Leu Asp Lys Ile Leu Asn Phe Pro Lys Thr Cys Pro His Gly Gly
      115              120              125

Val Ile Pro Arg Gly Asn Ser Asp Ala Ala Ala Pro Gly Thr Ser Ile
      130              135              140

Leu Asn Phe Glu Pro Gly Glu Arg Val Thr Val Arg Arg Val Arg Arg
      145              150              155              160

Asp Lys Thr Glu Leu Leu Val Tyr Leu Ser Ser Lys Asp Ile Tyr Ile
      165              170              175

Gly Asn Thr Val Glu Ile Val Ser Lys Asp Asp Thr Asn Lys Val Ile
      180              185              190

Ile Leu Lys Arg Asn Asp Ile Val Thr Ile Leu Ser Tyr Glu Asn Ala
      195              200              205

Met Asn Ile Phe Ala Glu Lys
      210              215

```

&lt;210&gt; 21

&lt;211&gt; 213

&lt;212&gt; PRT

&lt;213&gt; Staphylococcus aureus

&lt;400&gt; 21

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Met Leu Thr Glu Glu Lys Glu Asp Tyr Leu Lys Ala Ile Leu Thr Asn
 1              5              10              15

Asn Gly Asp Lys Asn Phe Val Thr Asn Lys Ile Leu Ser Gln Phe Leu
      20              25              30

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Asn	Ile	Lys	Pro	Pro	Ser	Val	Ser	Glu	Met	Val	Gly	Arg	Leu	Glu	Lys
35						40			45						
Ala	Gly	Tyr	Val	Glu	Thr	Lys	Pro	Tyr	Lys	Gly	Val	Arg	Leu	Thr	Glu
50						55			60						
Asp	Gly	Leu	Thr	His	Thr	Leu	Asp	Ile	Ile	Arg	His	Arg	Leu	Leu	Glu
65						70			75			80			
Leu	Phe	Leu	Ile	Glu	Ile	Leu	Lys	Tyr	Asn	Trp	Glu	Glu	Val	His	Gln
			85						90			95			
Glu	Ala	Glu	Ile	Leu	Glu	His	Arg	Ile	Ser	Asp	Leu	Phe	Val	Glu	Arg
			100						105			110			
Leu	Asp	Ser	Leu	Leu	Asn	Phe	Pro	Glu	Thr	Cys	Pro	His	Gly	Gly	Val
115						120						125			
Ile	Pro	Arg	Asn	Asn	Glu	Tyr	Lys	Glu	Lys	Tyr	Ile	Thr	Thr	Ile	Leu
130						135						140			
Asn	Tyr	Glu	Pro	Gly	Asp	Ile	Val	Thr	Ile	Lys	Arg	Val	Arg	Asp	Lys
145						150						155			
Thr	Asp	Leu	Leu	Ile	Tyr	Leu	Ser	Ser	Lys	Asp	Ile	Ser	Ile	Gly	Asn
			165						170			175			
Glu	Val	Glu	Ile	Val	Ser	Lys	Asp	Glu	Met	Asn	Lys	Val	Ile	Ile	Ile
			180						185			190			
Lys	Arg	Asn	Asp	Asn	Val	Ile	Ile	Val	Ser	Tyr	Glu	Asn	Ala	Met	Asn
195						200						205			
Met	Phe	Ala	Glu	Lys											
210															

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<210> 22
<211> 222
<212> PRT
<213> Enterococcus faecalis
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<400> 22
Met Thr Pro Asn Arg Glu Asp Tyr Leu Lys Leu Ile Phe Glu Leu Gly
  1                               5          10          15

Gly Asp Glu Val Lys Val Asn Asn Lys Gln Ile Val Ser Gly Leu Asp
      20          25          30

Val Ser Ala Ala Ser Val Ser Glu Met Ile Ser Lys Leu Val Lys Glu
      35          40          45

Asp Leu Val Glu His Ser Pro Tyr Gln Gly Val Gln Leu Thr Glu Lys
      50          55          60

Gly Leu Lys Lys Ala Ser Thr Leu Ile Arg Lys His Arg Ile Trp Glu
      65          70          75          80

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<210> 23
<211> 215
<212> PRT
<213> Streptococcus gordonii

<400> 23
Met Thr Pro Asn Lys Glu Asp Tyr Leu Lys Cys Leu Tyr Glu Leu Gly
  1              5              10              15

Thr Arg His Asn Lys Ile Thr Asn Lys Glu Ile Ala Gly Leu Met Gln
      20              25              30

Val Ser Pro Pro Ala Val Thr Glu Met Met Lys Lys Leu Leu Ala Glu
      35              40              45

Glu Leu Leu Ile Lys Asp Lys Lys Ala Gly Tyr Leu Leu Thr Asp Leu
  50              55              60

Gly Leu Lys Leu Val Ser Asp Leu Tyr Arg Lys His Arg Leu Ile Glu
  65              70              75              80

Val Phe Leu Val His His Leu Gly Tyr Thr Thr Glu Glu Ile His Glu
      85              90              95

Glu Ala Glu Val Leu Glu His Thr Val Ser Asp His Phe Val Glu Arg
      100              105              110

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Leu Asp Gln Leu Leu Asp Tyr Pro Lys Ala Cys Pro His Gly Gly Thr  
 115 120 125  
 Ile Pro Ala Lys Gly Glu Leu Leu Val Glu Lys His Lys Leu Thr Leu  
 130 135 140  
 Glu Glu Ala Lys Glu Lys Gly Asp Tyr Ile Leu Ala Arg Val His Asp  
 145 150 155 160  
 Asn Phe Asp Leu Leu Thr Tyr Leu Glu Arg Asn Gly Leu Gln Val Gly  
 165 170 175  
 Lys Thr Ile Arg Phe Leu Gly Tyr Asp Asp Phe Ser His Leu Tyr Ser  
 180 185 190  
 Leu Glu Val Asp Gly Gln Glu Ile Gln Leu Ala Gln Pro Ile Ala Gln  
 195 200 205  
 Gln Ile Tyr Val Glu Lys Ile  
 210 215

<210> 24

<211> 217

<212> PRT

<213> Streptococcus mutans

<400> 24

Met Thr Pro Asn Lys Glu Asp Tyr Leu Lys Ile Ile Tyr Glu Leu Ser  
 1 5 10 15  
 Glu Arg Asp Glu Lys Ile Ser Asn Lys Gln Ile Ala Glu Lys Met Ser  
 20 25 30  
 Val Ser Ala Pro Ala Val Ser Glu Met Val Lys Lys Leu Leu Glu  
 35 40 45  
 Asp Leu Val Leu Lys Asp Lys Gln Ala Gly Tyr Leu Leu Thr Lys Lys  
 50 55 60  
 Gly Gln Ile Leu Ala Ser Ser Leu Tyr Arg Lys His Arg Leu Ile Glu  
 65 70 75 80  
 Val Phe Leu Met Asn His Leu Asn Tyr Thr Ala Asp Glu Ile His Glu  
 85 90 95  
 Glu Ala Glu Val Leu Glu His Thr Val Ser Asp Val Phe Val Glu Arg  
 100 105 110  
 Leu Asp Lys Phe Leu Asn Tyr Pro Lys Val Cys Pro His Gly Gly Thr  
 115 120 125  
 Ile Pro Gly His Gly Gln Pro Leu Val Glu Arg Tyr Arg Thr Thr Leu  
 130 135 140  
 Lys Gly Val Thr Glu Met Gly Val Tyr Leu Leu Lys Arg Val Gln Asp  
 145 150 155 160

Asn Phe Gln Leu Leu Lys Tyr Met Glu Gln His His Leu Lys Ile Gly  
165 170 175

Asp Glu Leu Arg Leu Leu Glu Tyr Asp Ala Phe Ala Gly Ala Tyr Thr  
180 185 190

Ile Glu Lys Asp Gly Glu Gln Leu Gln Val Thr Ser Ala Val Ala Ser  
 . 195 200 205

Gln Ile Tyr Ile Glu Lys Lys Ala Tyr  
210 215

<210> 25

<211> 216

<212> PRT

<213> Streptococcus pneumoniae

<400> 25

Met Thr Pro Asn Lys Glu Asp Tyr Leu Lys Cys Ile Tyr Glu Ile Gly  
1 5 10 15

Ile Asp Leu His Lys Ile Thr Asn Lys Glu Ile Ala Ala Arg Met Gln  
20 25 30

Val Ser Pro Pro Ala Val Thr Glu Met Ile Lys Arg Met Lys Ser Glu  
35 40 45

Asn Leu Ile Leu Lys Asp Lys Glu Cys Gly Tyr Leu Leu Thr Asp Leu  
50 55 60

Gly Leu Lys Leu Val Ser Glu Leu Tyr Arg Lys His Arg Leu Ile Glu  
65 70 75 80

Val Phe Leu Val His His Leu Asp Tyr Thr Ser Asp Gln Ile His Glu  
85 90 95

Glu Ala Glu Val Leu Glu His Thr Val Ser Asp Leu Phe Val Glu Arg  
100 105 110

Leu Asp Lys Leu Leu Gly Phe Pro Lys Thr Cys Pro His Gly Gly Thr  
115 120 125

Ile Pro Ala Lys Gly Glu Leu Leu Val Glu Ile Asn Asn Leu Pro Leu  
130 135 140

Ala Asp Ile Lys Glu Ala Gly Ala Tyr Arg Leu Thr Arg Val His Asp  
145 150 155 160

Ser Phe Asp Ile Leu His Tyr Leu Asp Lys His Ser Leu His Ile Gly  
165 170 175

Asp Gln Leu Gln Val Lys Gln Phe Asp Gly Phe Ser Asn Thr Phe Thr  
180 185 190

Ile Leu Ser Asn Asp Glu Asp Leu Gln Val Asn Met Asp Ile Ala Lys  
 195 200 205

Gln Leu Tyr Val Glu Lys Ile Asn  
 210 215

<210> 26

<211> 216

<212> PRT

<213> Streptococcus pyogenes

<400> 26

Met Thr Pro Asn Lys Glu Asp Tyr Leu Lys Cys Ile Tyr Glu Ile Gly  
 1 5 10 15

Ile Asp Leu His Lys Ile Thr Asn Lys Glu Ile Ala Ala Arg Met Gln  
 20 25 30

Val Ser Pro Pro Ala Val Thr Glu Met Ile Lys Arg Met Lys Ser Glu  
 35 40 45

Asn Leu Ile Leu Lys Asp Lys Glu Cys Gly Tyr Leu Leu Thr Asp Leu  
 50 55 60

Gly Leu Lys Leu Val Ser Glu Leu Tyr Arg Lys His Arg Leu Ile Glu  
 65 70 75 80

Val Phe Leu Val His His Leu Asp Tyr Thr Ser Asp Gln Ile His Glu  
 85 90 95

Glu Ala Glu Val Leu Glu His Thr Val Ser Asp Leu Phe Val Glu Arg  
 100 105 110

Leu Asp Lys Leu Leu Gly Phe Pro Lys Thr Cys Pro His Gly Gly Thr  
 115 120 125

Ile Pro Ala Lys Gly Glu Leu Leu Val Glu Ile Asn Asn Leu Pro Leu  
 130 135 140

Ala Asp Ile Lys Glu Ala Gly Ala Tyr Arg Leu Thr Arg Val His Asp  
 145 150 155 160

Ser Phe Asp Ile Leu His Tyr Leu Asp Lys His Ser Leu His Ile Gly  
 165 170 175

Asp Gln Leu Gln Val Lys Gln Phe Asp Gly Phe Ser Asn Thr Phe Thr  
 180 185 190

Ile Leu Ser Asn Asp Glu Asp Leu Gln Val Asn Met Asp Ile Ala Lys  
 195 200 205

Gln Leu Tyr Val Glu Lys Ile Asn  
 210 215

<210> 27  
 <211> 19  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Consensus  
 sequence

<400> 27  
 gtaggttagg ctaacctat 19

<210> 28  
 <211> 19  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Consensus  
 sequence

<400> 28  
 ttaggttagg ctaacctaa 19

<210> 29  
 <211> 19  
 <212> DNA  
 <213> *Corynebacterium diphtheriae*

<400> 29  
 ttaggatagc ttacctaa 19

<210> 30  
 <211> 19  
 <212> DNA  
 <213> *Streptomyces pilosus*

<400> 30  
 ttaggttagg ctcacctaa 19

<210> 31  
 <211> 19  
 <212> DNA  
 <213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: 16S ribosomal RNA

<400> 31  
 ccagggtatc taatcctgt 19

<210> 32  
 <211> 19  
 <212> DNA  
 <213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: 19 kDa antigen

<400> 32  
 gcaggccagt gaaacctgt 19

<210> 33  
 <211> 20  
 <212> DNA  
 <213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: htrA homologue

<400> 33  
 acaggtggtg ctcaaccacg 20

<210> 34  
 <211> 20  
 <212> DNA  
 <213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: phoP homologue

<400> 34  
 gaaggtaacg ttcaaccaat 20

<210> 35  
 <211> 20  
 <212> DNA  
 <213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: adhB homologue

<400> 35  
 gcaggtgacc gtcaaccgat 20

<210> 36  
 <211> 19  
 <212> DNA  
 <213> Unknown Organism

<220>  
 <223> Description of Unknown Organism: narG homologue

<400> 36  
gaaggtcaac caaacaaga